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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/699,172

10/31/2003

James R. Heath

10981971-5

1625

7590

10/04/2004

HEWLETT-PACKARD COMPANY

Intellectual Property Administration

P.O. Box 272400

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EXAMINER

WILLE, DOUGLAS A

ART UNIT

PAPER NUMBER

2814

DATE MAILED: 10/04/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/699,172

Applicant(s)

HEATH ET AL.

Examiner

Douglas A Wille

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 43-60 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 43-60 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 10/03.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Double Patenting

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2. Claims 48 – 60 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 34 – 40 and 45 - 49 of U.S. Patent No. 6,314,019. Although the conflicting claims are not identical, they are not patentably distinct from each other because the same limitations are claimed.

3. For claim 48 of the Application see claim 34 of the Patent.

4. For claim 49 of the Application see claim 35 of the Patent.

5. For claim 50 of the Application see claim 36 of the Patent.

6. For claim 51 of the Application see claim 37 of the Patent.

7. For claim 52 of the Application see claim 38 of the Patent.

8. For claim 53 of the Application see claim 39 of the Patent.

9. For claim 54 of the Application see claim 45 of the Patent.

10. For claim 55 of the Application see claim 46 of the Patent.

11. For claim 56 of the Application see claim 47 of the Patent.

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12. For claim 57 of the Application see claim 40 of the Patent.
13. For claim 58 of the Application see claim 40 of the Patent and note that hysteresis is inherent in bistability
14. For claim 59 of the Application see claim 48 of the Patent.
15. For claim 60 of the Application see claim 49 of the Patent.

Claim Rejections - 35 USC § 102

16. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

17. Claims 48, 50 – 56 and 60 are rejected under 35 U.S.C. 102(b) as being anticipated by Nagasubramanian et al.
18. With respect to claim 48, Nagasubramanian et al. show a method of operating a crossed wire device (see cover Figure and column 2, line 47 et seq.) where the junction of the crossed wires has a connector species with TCNQ (column 3, line 18), the thickness of the TCNQ layer is about 1 micron which includes less than 1 micron and is thus in the nanometer range and is, in effect, an electrochemical cell. The method shown involves biasing the crossed wires to cause an electrochemical reaction and switch the state of the material.
19. With respect to claims 50, 51 and 52, the wires of Nagasubramanian et al. are nominally of submicron dimensions and are clearly long enough to include more than one crossing location.
20. With respect to claim 53, the structure is switchable to a stable state (column 4, line 48).

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21. With respect to claim 54, the structure is a resistor (column 4, line 61).
22. With respect to claim 55, each wire is a conductor.
23. With respect to claim 56, an insulating layer is provided over the upper electrode (column 3, line 35).
24. With respect to claim 60, the resistance is read with a lower voltage than the switching voltage.

Claim Rejections - 35 USC § 103

25. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

26. Claim 43 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nagasubramanian et al.
27. With respect to claim 43 Nagasubramanian et al. show that a memory function can also be provided with an irreversible material (column 1, line 60) and it would be obvious to use this function to provide a different class of functions.
28. Claims 44 – 47 and 57 - 59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagasubramanian et al. in view of Potember et al.
29. With respect to claim 57, Potember et al. show (see abstract) that with TCNQ switching can be accomplished with nanosecond speeds. It would be obvious to modify the Nagasubramanian device to use TCNQ without the polypyrrole to achieve the high switching rate. The Potember et al. device switches between two stable states (column 4, line 46).

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30. With respect to claim 45, the Potember et al. device switches between two stable states (column 4, line 46).

31. With respect to claim 46, it would be obvious to design the device to operate with different resistance values which are adjustable by changing the thickness and any thickness level would be obvious.

32. With respect to claim 47, it would be obvious to use any switchable organic material as a design alternative.

33. With respect to claims 58 and 59, Potember et al. show the process is a redox reaction (column 4, line 9) which inherently shows hysteresis due to the bistability.

34. Claim 49 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nagasubramanian et al. in view of Potember et al. and further in view of Aviram et al.

35. Aviram et al. show that a tunnel junction device can be formed (see abstract) in an x-y matrix using TNCQ (column 8, line 68) and show that the device can be controlled with optical and thermal means as well as electrical means. It would be obvious to use the Aviram et al. structure in the Nagasubramanian et al., Potember et al. device to provide the extra degrees of control and thus expand the utility of the device.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Douglas A Wille whose telephone number is (571) 272-1721. The examiner can normally be reached on M-F (6:15-2:45).

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'Douglas A. Wille', is positioned above the printed name and title.

Douglas A. Wille
Primary Examiner